

What is claimed is:

1. A light emitting device comprising an LED and one or more phosphor materials, wherein for each phosphor material, the product of (incident LED flux) x (excitation cross-section of the phosphor) x (phosphor material decay time) is less than 0.3.
2. The device of claim 1, wherein the LED is comprised of a semiconductor material.
3. The device of claim 1, wherein the LED emits light between 350 and 490 nm.
4. The device of claim 1, wherein the product is less than 0.1.
5. The device of claim 1, wherein the phosphor material provides  $\text{Eu}^{2+}$ - $\text{Mn}^{2+}$  energy transfer.
6. The device of claim 1, wherein said phosphor material includes at least one of  $\text{Eu}^{3+}$ ,  $\text{Tb}^{3+}$ ,  $\text{Mn}^{4+}$ ,  $\text{Pr}^{3+}$ ,  $\text{Eu}^{2+}$ , or  $\text{Ce}^{3+}$ .
7. The device of claim 6, including a first phosphor material dispersed farther from the LED chip than the phosphor of claim 6 and wherein said first phosphor material has a slower decay time than the phosphor of claim 6.
8. The device of claim 1, including at least one phosphor with a faster decay time placed closer to the LED chip and at least one phosphor having a slower decay time further from the LED chip.
9. The device of claim 1, wherein said phosphor material is positioned remote to the LED.

10. The device of claim 1, including a first phosphor material having a fast decay time positioned in a first layer adjacent to the LED and a phosphor material in a second layer having a longer decay time and positioned remote to the LED.

11. The device of claim 10 having three or more phosphor layers.

12. The device of claim 11, wherein each phosphor layer in a direction outward from the LED has a longer decay time.

13. The device of claim 10 wherein said phosphor layers are comprised of one or more phosphor.

14. The device of claim 1 including a phosphor with a decay time less than about 1 ms and positioned relatively closer to the LED and a phosphor positioned farther away from the LED and having a decay time of greater than about 3 ms.

15. The device of claim 8, wherein  $\text{Eu}^{2+}$ - $\text{Mn}^{2+}$  phosphors are used in the layers farther from the LED.

16. A method for producing a phosphor conversion LED lamp, the method comprising the steps of providing an LED chip and subsequently depositing one or more phosphor materials over the LED chip, wherein the phosphor materials are selected and deposited such that for each phosphor material, the product of (incident LED flux) x (excitation cross-section of the phosphor) x (phosphor material decay time) is less than 0.3.